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ABSTRACT

This report explores various ways to increase the relevance of education for health care professionals as a strategy for improving the quality of health care and increasing access to services. Noting that the health work force can account for up to 70 percent of the health budget, the report concentrates on innovations in education that can make learning easier and more efficient while also producing graduates equipped with the knowledge and skills most relevant to high priority health problems. Particular attention is given to factors that are known to influence the success of two kinds of innovations: those dealing with the learning process and those dealing with the relevance of education to community needs and practices. The report also challenges educational institutions to expand their sphere of influence to include advice and guidance on the development of health policy and services and provides examples of innovative approaches. The report is organized in five main sections that cover the following topics: (1) the need for a fresh look at the education of health professionals, (2) learning from innovations in the education of health professionals; (3) creating links with new partners in the community; (4) strategies for change applied to health systems and to educational institutions; and (5) organizational and practical issues. Recommendations are made to educational institutions, member nations of the World Health Organization (WHO), and to WHO as an organization. Contains 24 references and 10 suggestions for further reading. (KC)

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WHO Technical Report Series
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INCREASING THE RELEVANCE OF EDUCATION FOR HEALTH PROFESSIONALS

ED 378 314

Report of a WHO Study Group on Problem-Solving Education for the Health Professions

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Report of a WHO Study Group on
Problem-Solving Education for the Health Professions

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Geneva, 20–23 October 1992

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1. The need for a fresh look at the education of health professionals

Many improvements are still required in most health care systems to ensure equal access to all who seek health care, as well as optimal protection against avoidable causes of suffering and death. To make these improvements, there is a need for additional resources for health care, including human resources, and a need to use existing resources better in both rich and poor countries (*1*). Because the health workforce can account for up to 70% of the recurrent health budget, it is natural that it should be carefully analysed and rationalized as an important step towards better use of existing resources.

Health professional education has been widely criticized as being not relevant enough to society's health needs. Most health professionals have had little training in the wider aspects of health: the sophistication of their biomedical and clinical training is not matched by comparable training in relevant social sciences, and they have little opportunity to learn from role models how to address the social, economic and political forces affecting health. In addition, the institutions in which health professionals are trained are often isolated from decision-making about health service delivery and health policy.

Innovative approaches aimed at improving health professional education have emerged in recent decades. Most have focused on reforming the educational processes within the institution. New instructional strategies have been introduced in various schools to enhance professional skills. Some such strategies, while focusing on community[1] needs, have been based solely within the educational institution. In other strategies, experience in the community has been introduced to supplement an existing programme. Educational planning has remained isolated in most cases from consumer needs and the needs of health service delivery. Moreover, many innovations have been reactive rather than proactive. The result is that most innovations are likely to have a limited impact on the evolution of health services. It is unlikely that educational reform *per se* will improve health unless it is the result of close interaction and planning between health services and other sectors in society.

A WHO Study Group was convened in Geneva from 20 to 23 October 1992 to consider, and evaluate the impact of, current practices in problem-solving education for the health professions. From the Study Group's early deliberations emerged the conviction that a wider perspective was appropriate for its discussions; its report is therefore intended to outline, more generally, how health professional educational

[1] There are many definitions of "community". Here it is defined as the target population of a health service unit. The term can be broadened to include individuals sharing a common geographical, social, cultural, economic and/or political system, or individuals in a common worksite, school or occupation (*2*).

institutions can influence health care delivery by redefining their role and expanding it in the domain of health policy and health service delivery. Collaboration of the health professional education sector with the health services sector will help ensure that future health professionals are better prepared to identify and address health problems in society, while enabling the health services sector to provide and support career opportunities for these graduates that are consistent with their training.

Within the general context of health professional education and practice, whose impact can only be analysed holistically, this report focuses on new challenges for educational institutions.[1] It reviews the current situation and makes proposals for action that stem from a perception of education as both an art and a science to prepare future health professionals to function properly in society. Educational institutions should be actively concerned with the conditions and circumstances under which future graduates will function (*3*). This implies accountability to society at large for the number and nature of graduates and the relevance of their training to prevailing health needs.

Educational institutions are encouraged to extend their responsibilities and programmes beyond their traditional sphere of influence. Links between educational institutions and the service environment now exist to various degrees: for example, when students are assigned to health settings and when teachers supervise health personnel, as well as their own students.

The proposed linkage between education and services should integrate and build upon past efforts to improve relevance and previous innovations at all levels of health professional education – from student selection, training and continuing professional education to health service delivery, and from primary through to tertiary care. Finally, such a linkage should address the priority health care needs of society.

2. Learning from innovations in the education of health professionals

2.1 Educational innovations

Traditional academic interests – research and teaching – tend to ignore the realities of health service delivery. Yet the search for relevance in the education of health professionals has been a continuing process and has had many important positive results. In the past, the scrutiny has largely been on curriculum or teaching methods, and has often been based on a hypothetical and idealized professional role. The result is heavily biased

[1] As used in this report, the term "educational institution" means an educational institution for health professionals.

towards what it is desirable for a student to know, rather than what a student needs to know. But enormous advances in scientific knowledge, often rapidly superseded, have more recently required educators to reconsider the methods and objectives of health professional education. During the last two decades, certain concepts and approaches have become popular, some of which are explained in the box.

Imparting discrete facts and organizing knowledge by discipline simplify the task of teachers, but do not necessarily help learners to acquire easily and efficiently the skills they need to address the health problems they are likely to encounter in practice. When compared with traditional educational strategies, innovations such as problem-based learning are more consistent with the manner in which health professionals identify and address problems in their workplace. Besides having benefits for the learner, problem-based learning can make programmes more relevant and responsive to health care needs. It offers greater opportunities for team teaching, which can include teachers from a broad range of disciplines; an

Problem-based learning is a method by which the student or health worker uses the situation of an individual patient, a health delivery question or a research topic as a stimulus for learning. After an initial analysis of the problem, students define learning objectives for their self-directed learning and obtain the information needed to address the problem. They then report their findings and evaluate what they have gained. Problem-based learning in health professional education "has three educational objectives: the acquisition of an integrated body of knowledge related to the problem, the development or application of problem-solving skills, and the learning of clinical reasoning skills" (*4*).

Student-centred education refers to instructional strategies that depend upon the capacities and motivation of the learner. Although the teacher may provide the student with considerable guidance in the beginning, the student is expected eventually to take full responsibility for self-learning. The emphasis is on active acquisition of information and skills by the student, depending on the way he or she learns best, an appropriate pace of learning, and the student's ability to identify personal educational needs and evaluate progress (*4*).

Community-based education "consists of learning activities that use the community extensively as a learning environment, in which not only students but also teachers, members of the community, and representatives of other sectors are actively engaged throughout the educational experience" (*5*).

Community-oriented education is characteristic of an institution whose aims, objectives and basic principles are determined by the needs of the community within which the institution is located, whose programme adopts a comprehensive rather than a mainly curative approach to health, and whose programme activities indicate commitment to the goal of health for all.

interdisciplinary approach can prevent parts of the curriculum from becoming either isolated or overloaded. Problem-based learning is therefore an important educational strategy to improve professional education. This report does not discuss in detail the implementation of problem-based learning (see the section "Recommended further reading" for additional information sources); it does, however, examine how non-traditional approaches to education, such as problem-based learning, can be improved to ensure that health professionals are being prepared to meet priority health needs.

An increasing number of educational institutions have been attracted by the potential of problem-based learning, and some have begun to use it, but from experience around the world it is clear that problem-based learning alone is not sufficient to make education more relevant. Even in a problem-based curriculum, students' learning may still be focused on the traditional basic and clinical disciplines and departments (e.g. anatomy, biochemistry, surgery, paediatrics) to the exclusion of social and community problems – a situation not very different from that of traditional teaching. In a recent study of the primary-care-related content of a problem-based curriculum, it was found that the problems used for learning frequently consisted of common complaints atypically exacerbated by serious complications requiring specialist care. Students were thus getting a biased view of primary care, and an incorrect epidemiological perspective on health care problems (*6*).

The problem-based learning approach can be used to make educational programmes more relevant to health needs if the selection of problems in a curriculum reflects the health care needs that graduates will face. It is also important that problem-based learning and other educational approaches should reflect the practice environment, in which the health professional must make decisions that take into account the resources of and the constraints facing individual patients and the community as a whole. Therefore it is critical that educational institutions should develop new links with the service system that will guide them in the design of educational programmes and other efforts to serve society.

It must be recognized, of course, that any educational approach, however innovative and promising, cannot by itself change the way health practitioners work. There are a number of political, social and economic determinants which have more influence on practice patterns. Many of these operate in the environment in which graduates work. All of these conditions will have to be taken into account in defining new roles for educational institutions. Before a new mandate for educational institutions can be considered, however, the results of current educational innovations must be reviewed.

2.2 Measuring the effects of educational innovations

The evaluation of innovations in the education of health professionals has commonly concentrated on effects on students and teachers, with less attention paid to practice patterns and very little attention to the effects on health in the community. The evaluation process must link the impact of educational innovations on health care delivery with the extent to which the educational institution has assumed responsibility for meeting society's health needs and expectations.

The evaluation process should be designed and initiated at the early stages of planning and implementation of educational programmes. It should be included in the mission statement and goals of the educational institution and serve as a source of continuing feedback to those who are planning and implementing the programme (*7-9*). In many instances, institutions have declared their wish to improve the health of the community, but few evaluation models address this issue; most restrict themselves to the educational domain.

Indicators of educational outcomes should be considered from the point of view both of innovations that deal with the learning process – for example, problem-based learning – and of innovations that deal with the relevance of education to community needs and priorities. A number of educational institutions have introduced innovations in both domains simultaneously, but they are definitely in the minority.

There is as yet no convincing proof that problem-based learning is superior to conventional methods of instruction in influencing the learning process, the enduring acquisition of problem-solving skills and the choice of career. However, there is growing evidence that problem-based learning may lead to the desired outcomes if attention is paid to defining priority health problems as a basis for education and to extending the educational institution's sphere of influence to health care delivery and management (*10*). The following outcomes of problem-based learning can be measured and evaluated:

Outcomes for the individual

- satisfaction with learning experience
- retention and application of information
- information search and management skills
- preparation for clinical learning/experience
- enhanced critical thinking and reasoning skills
- ability to promote teamwork.

Outcomes for the educational institution

- increased research on health sector problems
- greater community relevance of continuing education and re-education programmes for health service providers

- increased information base about community problems and methods for their solution
- increased interdisciplinary cooperation in training and research.

Evidence of the value of problem-based learning has been described in a number of articles. For example, individuals exposed to problem-based learning have been reported to have the same or better clinical skills (*11*) and to experience less distress and greater enthusiasm for and satisfaction with their learning than those in traditional programmes (*12*).

It is also important to document the effects of the linkage between educational institutions and the health service sector. Because problem-solving and community-oriented activities or programmes are complex and the variables influencing outcomes are numerous, multiple evaluation methods must be employed. These methods can include both qualitative and quantitative measures, not only of outcomes but also of the process of change and development in programme planning. Qualitative studies (e.g. those that use critical-incident recording or semistructured interviews, among other techniques) are sometimes preferable – for instance, to reflect gradual shifts in the attitude of students, teachers and community members to new programmes.

Table 1 lists some of the valuable outcomes of a link between educational institutions and the health sector or community, while the box (pages 8-9) gives examples of successful links in different settings in different parts of the world.

Available data on outcomes of innovations within educational institutions reveal that students who complete community-oriented programmes possess enduring self-directed learning skills and appear more comfortable with uncertainty (*14*). Those who as students benefit from a variety of role models in a community setting are more likely to work in underserved communities and to practise in primary care settings (*13, 14*). In the United States of America, the WAMI programme (Washington, Alaska, Montana, Idaho), Michigan State University's Upper Peninsula Programme, the Primary Care Programme at the University of Illinois College of Medicine at Rockford and the Primary Care Curriculum at the University of New Mexico have succeeded in recruiting medical students from rural areas who intend to practise primary care in medically underserved areas.

However, many institutions and educators contemplating changes in educational practices are looking for more evidence that innovations will have a long-term positive effect on the behaviour of health practitioners and the health of patients and/or communities. There are insufficient data on the long-term effects of such innovative methods as community-oriented, problem-based learning relating to health indices of populations, quality of patient care and lifelong learning.

Table 1
Outcomes of links between educational institutions and the health sector in the community

Possible effects on educational institutions
Making mission more relevant to community health needs
Recruitment of students more appropriate to health service needs
Increased responsiveness of educational institutions to health service requests and needs of the community
Changes in curriculum to reflect priority health service needs in the community
Changing research priorities towards health policy and health service outcomes
Increased involvement in health policy decisions
Increased advocacy of healthy behaviour in the population
Possible effects on the health sector in the community
Improved policy formulation
Increased access to care
Increased coverage of care
Better allocation of resources
Appropriate use of technology
Appropriate distribution, use and reorientation of health personnel geographically and by specialty
Participation of community at all levels of intervention
Consumer satisfaction with health service
Improved health status of population

Programmes may be difficult to evaluate on a long-term basis for the following reasons:

- The variables in the practice environment are complex (e.g. the lure of financial incentives, oversupply of specialists in some fields).
- The patient load may be high, constantly changing and difficult to follow up.
- Field-based long-term evaluation is expensive to carry out.
- Few financial resources are allocated to evaluation.
- Postgraduate training has a profound impact.
- Community sites may be isolated from the university setting or research teams.
- Constraints on treatment duration may be imposed by government or private providers.
- Changes may take place in health workers' goals or family circumstances.
- Consumers' expectations may change rapidly so that they demand and get a different sort of service.

Retention of health personnel in the community and improved human resource allocation

More than 60% of health workers trained in the Philippines eventually emigrate. To counteract that exodus, the University of the Philippines Institute of Health Sciences has conducted a programme on Leyte Island since 1976 to produce clinicians at all levels — from village health workers to physicians — who are also community developers with managerial skills. Students are nominated to the programme by fellow villagers who believe they should become health workers; the resulting social contract effectively commits students to return to their community upon graduation. The programme's stepladder design permits students to leave after completing the part of the curriculum appropriate to the service they intend to perform. Since the programme's inception, more than 750 health workers have graduated, virtually all of whom remain on Leyte. Of the 295 graduates of the nursing programme as of 1989, 85% had passed the national examinations. Of the first 25 graduates of the MD degree programme, 23 passed the national examination; of these, 21 were practising primary care on the island as of 1989 (*13*).

Response of an educational institution to community/health service requests

In one of the cities of Upper Egypt, the representative of the city council contacted a professor at the school of nursing, with the following problem:

> The mountain people from the east of the region are living in complete isolation from the rest of the community. Women and children are confined to their rock houses without any exposure to fresh air and sunshine. This community has many problems, but since it is so isolated, nobody can identify all of them.

In asking for help, the city council representative pointed out that female health workers, such as student nurses, would have easier access to the families.

This request had the following outcome:

- A health project was planned for the isolated mountain community.
- The governor of the city was contacted; he offered housing, food and transport for any students who came to the area.
- The president of the students' union at the school of nursing was contacted. She in turn contacted the presidents of the students' unions at the schools of medicine, dentistry and pharmacy, and a list was drawn up of volunteers willing to participate in the project.
- UNICEF was contacted; it offered technical help and provided the necessary equipment for a community health assessment.
- Pharmaceutical companies were contacted; they offered to provide medication such as vitamins, cold remedies and antiparasitic drugs for the project.
- Professors and teachers were recruited to supervise the students' work experience.

Impressed by the favourable outcome of the project, the school of nursing designated the region a training area to which female students would be assigned, and decided to include new community-based learning activities in its curriculum.

Concern of an educational institution to improve quality of care

Perceiving that advanced cancer patients appeared to be regarded as hopeless cases and thus to receive inadequate palliative care at home from general-practice teams in England, university investigators set out to persuade selected general-practice teams that palliative care in advanced cancer was feasible, justified and effective. To determine the educational needs of such teams in the area of palliative care, the investigators interviewed a sample of general practitioners to identify the tasks that gave the practitioners the most concern when treating advanced cancer patients. With this input, the university investigators designed a self-study programme on the palliative care of cancer patients. Computer software was then developed to enable groups of practitioners to explore aspects of palliative management of cancer patients. Each computerized "patient" either improves or is made worse by selected treatment or advice. Practitioners can see on the computer screen the consequences of their actions (and their mistakes). The self-study programme and the software reduced the practitioners' frustration in providing appropriate care for advanced cancer patients and increased their participation in the palliative care programme.

Furthermore, few educational institutions have the expertise and financial resources necessary to conduct studies on the impact of educational innovations on practitioners and consumers. It would take years to determine whether interventions based on the evaluation of outcomes have changed practice-related behaviour. Thus, most evaluations of students focus on short-term outcomes. Ongoing relationships between educational institutions and health service organizations might make it easier to design and implement studies to evaluate practitioners' performance or the impact of education.

3. Creating links with new partners

It is now generally understood that an adequate number and an appropriate mix of competent health personnel are essential for the successful implementation of health programmes. However, health professional education has not traditionally concerned itself with the number or nature of graduates. This observation leads to the general criticism that the education of health personnel is not sufficiently relevant to the priority health problems in society.

.1 16

3.1 Identifying and solving priority health problems in and with the community

Community participation in identifying and addressing priority health problems is critical because consumers' motivation to change their lifestyles or to participate in a community health activity is closely linked with their values, beliefs and perceived needs. Thus, to be effective, problem-solving in the community needs the participation of community representatives, formal and informal leaders, or a representative sample of the target population. Community representatives should be involved in identifying problems, in recommending intervention strategies and in evaluating results. This will help to prevent educational institutions using the community for instruction without providing the services which are actually needed. It will also help to prevent the community feeling that its medical needs are considered less important than its value as instructional material.

Key considerations for an educational institution, before linking up with community groups to identify and address priority health problems, include the following:

- The educational institution as a whole should deal with the community as a whole. The separate disciplines should not make independent arrangements.
- There should be a commitment to a broadened outlook and greater participation of the institution in health services in the community.
- The institution should require students at all levels (undergraduate, graduate and continuing education) to work in the community.

Recognition of and intervention in priority health problems in the community can consist of four steps:

1. *Defining and characterizing the community (target population).* The definition of "community" can include geographical, social and occupational criteria. The community concerned may be defined by its location (e.g. neighbourhood, village, school, workplace), by a health-related problem (e.g. hypertension, homelessness, infection with human immunodeficiency virus), by age group (e.g. infants, the elderly) or by risk group (e.g. young people at risk of becoming drug-dependent, lake dwellers at risk of developing schistosomiasis).
2. *Identifying the priority health problems in the community.* From among the various health problems identified in the community, priorities are set by a consensus among providers – whether private, public or a combination of the two – and consumers; by extrapolation from secondary data sources (e.g. census or large-area epidemiological data) and analysis of the scientific literature; or through formal mechanisms (e.g. surveys, structured interviews).
3. *Adjusting the existing health care programme to respond to identified problems in the community.* This can extend from responding to national or organization-wide initiatives to modifying the programme

to meet the unique needs of the community or mounting health care and public health interventions targeted on identified high-risk individuals in the community.

4. *Monitoring the effectiveness of programme change.* This ranges from subjective assessment to systematic examination of community-specific data.

Health professionals, through their workplace or organization, can become involved in these activities through alliances with health professionals in other sectors, community groups, government agencies and universities. Table 2 provides examples of indicators (of health problems, service provision, etc.) that were developed by groups of health professionals belonging to different institutions and at different levels of the health system – district problem-solving teams – who worked jointly in

Table 2
Examples of indicators developed by district problem-solving teams in Malaysia and Zimbabwe[a]

Priority health problem	Indicator of severity	Service indicator	Health indicator
Maternal deaths from postpartum haemorrhage in Terap/Sik district, Malaysia, 1986–1987	Percentage of grand multiparas aware of risk factors Number of calls received and attended by obstetric flying squads	Percentage of home deliveries by trained government midwife Percentage of hospital admissions of mothers after delivery elsewhere Percentage of high-risk mothers delivered by traditional birth attendants	Number of maternal deaths due to postpartum haemorrhage
Sexually transmitted diseases (STDs) in Gweru district, Zimbabwe, 1989–1990	Average number of months that STD drugs are out of stock Average score of nurses on test of diagnosis and treatment of STDs Difference between number of condoms issued and number distributed	Number of condoms distributed Number of health education workshops	Incidence of STDs

[a] From work carried out by members of Maternal and Child Health and Family Planning, World Health Organization, Geneva, as part of a series of workshops on district problem-solving in Malawi, Malaysia, Tunisia, Zambia and Zimbabwe.

planning, implementing and evaluating problem-solving interventions in the community. The various indicators allowed the teams to monitor progress in solving health problems and to identify difficulties in project management.

With supervision, students can become involved at every stage of community health interventions, either in blocks of time spent entirely in the community or in periodic visits to the community during other courses or clinical clerkships. However, it is important to ensure that this community experience is educational, enjoyable for the student and of benefit to the community; to this end, projects, communities and the interests of supervisors should be carefully matched and monitored.

Community health problems are often so complex, and interventions take so long to achieve success, that students can feel overwhelmed and discouraged about their role in a project. Intermediate targets can be identified to allow students to appreciate the contribution they have made. It is essential to create a learning environment that takes these problems into consideration. For any community-based project in which students are to participate, the following requirements should be met:

- Expected learning outcomes of the project must be specified.
- The project should include self-learning and performance evaluation.
- Students must be adequately supervised.

A number of further requirements must also be addressed (*15*):

- The community must participate.
- The project should deal with real health needs of the population.
- The project should ensure full service coverage for a population of adequate size.
- The project should involve epidemiological monitoring of risks and of the prevalent diseases.
- The project should include all relevant levels of care.
- The school's involvement should represent the broad spectrum of available disciplines, and it should receive appropriate financial support.
- The project should be involved in the implementation of priority health activities.
- Those actively involved in the community should be acknowledged as agents of social change.
- The school should be prepared to adapt its curriculum or strategic plan to the local health infrastructure.

The example described in the box demonstrates how a learning opportunity can evolve into an activity for improving health care. Planners and supervisors of community-based education must be aware of the delicate balance between service and education, and must ensure that the service is of high quality. The community should feel that it, too, benefits from the exercise (*15*).

A medical student in Uganda, during a period working in the community, was overwhelmed by an assignment to develop a project concerning AIDS. When a nurse at the community hospital expressed regret about the prejudice and rejection that people with AIDS face in their communities and in the health care system, the student decided to focus her energies on that aspect of the problem. She interviewed hospital personnel about their attitudes towards AIDS patients and interviewed AIDS patients about their experiences of prejudice and rejection in the health care system. Her findings ultimately became the basis for a workshop to review current knowledge on AIDS transmission and to help hospital personnel recognize and express their feelings about AIDS. They were then better equipped to give sympathetic care to people with AIDS.

3.2 Working in the community

Many medical and nursing curricula around the world require students to work in the community; others have introduced interdisciplinary teaching in related areas, such as health service research, community medicine, epidemiology and family dynamics. These "new" programmes tend to have little effect in changing students' attitudes, however, because they are often simply added to an existing overloaded curriculum rather than being integrated into it. Relevant curricula must, nevertheless, address the wider aspects of health, health promotion and prevention of illness. The social, economic and environmental factors affecting the health status of a population require more attention than is usually provided for in existing curricula.

Many explanations have been proposed for the strong preference of medical graduates for high-technology tertiary-care specialties. One is that the environment where medical students are trained is that of a sophisticated referral hospital (*16*). Professionals in many educational institutions and health services now realize, however, that to be relevant to the health problems of the community, education should take place outside the tertiary health science centre – in community health service facilities and in communities themselves. There, in addition to being exposed to primary care, which demands attention to curative, preventive, promotive and rehabilitative issues, students are also inescapably confronted by the reality of social, economic and managerial problems, which directly affect the organization of health care and, ultimately, health itself. These problems may be poorly grasped by students in classrooms or at the university health centre, where they are typically framed theoretically and are less effectively presented.

Learning in the community provides students with a different array of role models, including general practitioners, nurses, health care managers, political leaders, social workers and community organizers. These role

models often differ from health professionals trained in traditional educational institutions in the priority they give to problems and in their approaches to problem-solving. Through this exposure to a wider range of role models, the future health professional will learn to consider a broader array of diagnostic, analytical and intervention strategies in dealing with health problems.

If health professional education is to become broad enough to address adequately the issues of health care access, cost of care, allocation of scare resources, and maldistribution and inappropriate use of health personnel both geographically and by specialty, a partnership must be created between the education sector and the health services sector. To be effective, this partnership should influence the curriculum as a whole; a concerted approach is needed to increase the relevance of health professional education.

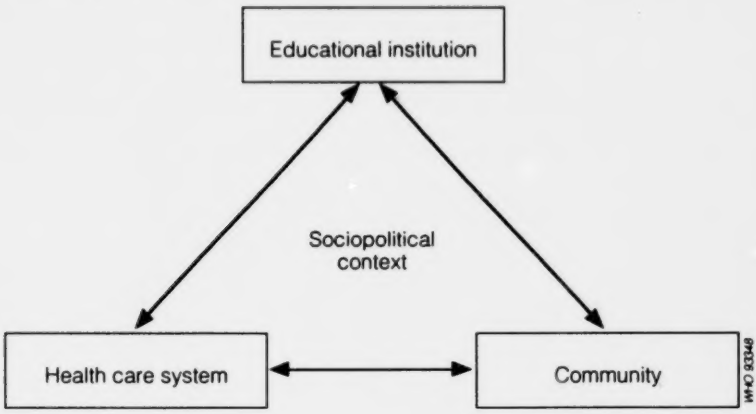
Such a partnership is not easy to establish, because of the complicated political, administrative and funding challenges both to the large, inward-looking educational institutions and to the health care delivery bureaucracies, which are more accustomed to traditional patterns of work and hierarchical control (*17*). Yet it is necessary if innovative educators are to work effectively and if the workers they train are to find jobs where their new ideas and approaches to health problems are valued.

From an organizational point of view, the relationships between an educational institution and its wider environment can be framed in an "organizational universe" that has two parts – one internal, the other external. The internal part involves the organizational structure, decision-making patterns, communication modalities and organizational components in the educational institution. The external environment involves every force outside the institution that can potentially affect its functioning. To establish a partnership, two subsystems in the external environment are vitally important: the health care system and the community (Fig. 1). The health care system includes components such as facilities, professional organizations, health finance and government regulations. The community includes the geographical area in which the institution operates, its people, and the political, cultural, economic and social realities.

Setting up a partnership requires educational institutions to face four major tasks that cut across the internal and external spheres:

- management of the internal environment
- interacting with the health care system
- interacting with the community
- establishing structural links between the institution and its external environment.

Figure 1
Relationships between the educational institution and its wider environment



3.3 Shaping health policy

Educational institutions can influence the formulation of health policies and the use of resources centrally as well as locally. Experts from these institutions often serve as consultants to government agencies, but as individuals they appear to have little influence on health policy. Instead, institutions as a whole should make their expertise available to health care managers, health professional organizations and other bodies and organizations that influence health policy. Examples of such input include: advising government bodies about cost-effective approaches to disease control, carrying out technical assessment and quality assurance studies, proposing career plans for new professional appointments and formulating suggestions for new legislation. Some specific areas in which educational institutions can contribute to health policy are identified below.

Appropriate use of pharmaceuticals

Some physicians now prescribe expensive antibiotics inappropriately to the point of being counterproductive to patients (e.g. fungal infection linked to overuse of cephalosporins). Research carried out by educational institutions on the rational prescription of drugs by physicians can become the basis of regulatory legislation.

Effective use of health personnel

The realization that patients with chronic diseases must often visit several specialists instead of having one practitioner who attends to all their problems can lead to the design of coordination mechanisms and alternative medical care delivery patterns.

Rational allocation of human resources

Some professional health workers – even in cases of severe shortage and particularly in underserved areas – do not allow "nonqualified" health personnel to assume duties they see as their own, even after appropriate training. Educational institutions for different categories of health personnel could use their authority and prestige to forge an understanding among professional workers and encourage the rational reallocation of duties.

Health-related legislation

Educational institutions can promote legislation that addresses health problems. For example, medical students and faculty members in New Mexico, concerned by the high incidence of deaths from gunshot wounds in the state, particularly among children, initiated a statewide programme to prevent gunshot injury. They developed a series of televised public service announcements in English and Spanish; produced a pamphlet for primary care physicians' waiting rooms warning parents to keep guns unloaded at home; and worked with state regulatory bodies and gun owners' organizations to encourage all firearms merchants to affix tags to the trigger guards of the weapons they sold, warning owners to store their guns unloaded (*18*).

4. Strategies for change applied to health systems and to educational institutions

Reform in the education of health professionals and in health services is not hampered by a lack of ideas. Instead, reform is more often stymied by a lack of political skills or a coherent action plan on the part of would-be reformers, or by inability to collaborate. These and other important barriers to change are discussed below.

4.1 Barriers to change

Fear of loss of control

Established authority will usually resist change when it fears loss of control, expressed as reduced powers, a threat to its command of a subject or recognized expertise, a loss of control of time allocation, or a loss of autonomy to control priorities at work. Thus, if the idea for change does not emerge from existing leadership or if it threatens that leadership's power base, ideas for change, no matter how worthy, will be opposed from the top. For example, most community-based education programmes pose some threat to the educational institution's authority over and control of education. Authority over community sites rests in the hands of the health service sector, out of the control of the education authorities. The animosity that commonly results often manifests itself in the educational institution's scepticism about the quality of community-based teaching.

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When the dean of one medical school in Israel sought to bring under his control the local health service that was run by the trade union, his efforts were sabotaged by clinic employees whose work schedules were affected and who maintained their allegiance to the former authorities (*17*).

Failure to align innovation with the perceived needs of the institution or service

Perceived needs for change usually differ for different constituencies in the institution or health service unit. Some teachers or health workers may want higher pay, more benefits, or more on-the-job training to advance their careers. Others may want improved teaching or service facilities, or better recognition or rewards for efforts already made. Constituencies (government, business or community) outside the institution or health service may demand more responsiveness to community needs from the education or service sector. If the innovator neither acknowledges these needs nor aligns the proposed innovation with these constituencies, it may win too few allies to bring about needed change.

Behaviour of the innovator that jeopardizes the change process

The same creative individualists who willingly challenge authority and convention and often contribute the most important ideas for needed change are also often the least capable of sharing ownership of their new ideas, listening to and learning from others who hold a different view, and compromising – all necessary for the political process of change. The ability to modify methods without sacrificing the core values and goals inherent in the innovation is a crucial skill for innovators. The innovator's willingness to compromise makes others feel recognized and empowered to contribute, and this encourages them to participate. Unfortunately, many innovators fiercely defend every aspect of their innovation as if afraid that to compromise and change would diminish their worth. This behaviour discourages the broad institutional or programme support that is essential for success.

The dean of a medical school in the United States of America wanted his plans for a problem-based curriculum to extend beyond the medical school to include premedical and postdoctoral studies. Despite almost universal rejection of this aspect of the proposed innovation, the dean insisted on it so strongly that he almost lost support for the entire project.

Fear that change will erode professional excellence

Health professionals may fear that increased teaching requirements will reduce the time available for maintaining and improving skills through treating patients and pursuing research. They may also fear that concentrating on priority health care needs may divert them from areas of professional interest that are of lower priority but greater technical sophistication, and may thus interfere with their ablility to remain at the forefront of their profession.

Fear that change will undermine the reward system

The promotion of faculty and health workers is usually based on a known and generally reliable reward system, whether it is related to research activity, efficient patient care or seniority. Proposals for major change often evoke fears of loss of expected rewards. Will an increased focus on education by teaching staff threaten research productivity and thus threaten promotion? Will health providers' income and promotion prospects be threatened by a demand that they spend more time on activities in preventive health and health services research, which might reduce their time for more lucrative technical procedures and biomedical research? Will compulsory work in the community reduce the opportunities for teachers with very low salaries to earn additional money outside their teaching role?

Security considerations

Factors such as isolation and physical safety can limit participation by students and health workers in community-based programmes. For example, the selection of inner-city community sites may be influenced by the incidence of drug-related crime. In one medical school in New York City, community projects are confined to the hospital campus because security in the surrounding neighbourhood is inadequate. In Guatemala, sites for rural student projects had to be agreed with the military authorities to ensure the safety of students and teaching staff. In South Africa, the safety of students in some community sites depends on their social and ethnic characteristics. Physical isolation poses another problem for students and health workers sent to areas remote from their families, friends and colleagues.

4.2 Strategies for change

To overcome these inevitable barriers, innovators must mount effective strategies to facilitate change (*19*). Many field-tested strategies for implementing changes in the education of future health professionals and in health service delivery have been described (*17, 20-23*).

The probability of successful change is increased when programmes for change are developed as action projects, so that they have stated objectives and strategies, are continuously monitored and receive feedback quickly. Action research implies that data are collected continuously and that all participants decide on the further steps to be taken when preliminary activities have yielded visible results. If people are made aware that variables can change during the project and that their contribution will be assessed as objectively as possible, they are more likely to remain involved in the innovation.

Successful, substantial change usually comes about when forces for change in society at large find like-minded agents for change within existing institutions and programmes. The following are examples of strategies for change.

Encourage broad participation

Major changes in service or education are rarely a product of an omniscient planner producing a master blueprint. Rather, a few individuals who serve as prime movers nurture the change, which flourishes as the innovators encourage input, consensus and ownership by a broad cross-section of the health care service or educational institution. With broad input the plan may lose some coherence and seem somewhat unwieldy. Yet it is preferable to develop an innovative plan that accurately expresses the collective interest and promotes partnerships for planning, implementing and evaluating the innovation. If potentially interested individuals feel excluded from early planning, they may feel undervalued or resentful and may actively oppose the innovation.

The strongest allies for change are often outside the institution or health service, either in communities, in government or in the economic sector. Mobilizing their support for change is often an effective strategy for promoting innovation within the institution or health service. Successful partnership could lead to increased institutional funding.

In collaborating with communities to identify priority health problems, a health service must often compromise if its priority list, derived from primary and secondary data sources, does not match the attitudes and beliefs of the target community. The priority assigned to health problems by urban slum dwellers in Bangkok, for example, differed from the priority derived from data analysis by health professionals (Table 3) (*24*). Such situations present opportunities to explain to the community the criteria and processes that health professionals use to identify health priorities.

Effective recruitment for any innovation includes an invitation to anyone interested to participate in it. Effective participation includes a responsibility on the part of participants to criticize the change constructively, adapt to it or improve it. If innovators are open to criticism and suggestions, this tends to attract others to the innovation.

The Shanghai Second Medical University introduced a problem-based, community-oriented educational track. Many basic scientists were

Table 3
Priorities assigned to health problems by slum dwellers and health professionals in Bangkok

Most important health problem	Epidemiological survey	People's perception
1st	Infection	Sanitation
2nd	Addiction	Flooding
3rd	Violence	Inadequate health services
4th	Pregnancy in young girls	Poor health leadership

reluctant to participate, so the innovators encouraged each department to experiment with the new curriculum. Staff tested the new ideas by creating hands-on tutoring sessions with their own students, using case problems they had developed. The process allayed fears and built up a sense of ownership and support for the new programme.

National epidemiology boards have been established in Cameroon and in Thailand as nongovernmental organizations. They serve and promote partnerships between communities, universities and the government in addressing issues of medical concern, including immunization rates, health resource allocation and health care financing.

Ensure that all participating constituencies benefit

Responding to requests from the state legislature for more physicians in rural areas, where medical services are most needed, innovators at the University of New Mexico sought to give medical students more experience in rural areas, starting with the students' first year. The plan was embraced by the administration of the medical school, a public institution. However, community-based education was alien to most medical school teachers, few of whom had ever practised outside medical institutions; they were more interested in research and specialty services. Support was gained for community-based activities by linking community outreach with health services and educational research, and by linking community-based education with the institution's need for a statewide, primary health care referral base. These linkages were accomplished through collaborative planning by medical educators, university hospital administrators and medical specialists, each of whom saw their own interests being served by such university/community linkages.

Maintain links with other innovative programmes

A rich, worldwide network now exists of innovative programmes for health professional education and service. It is far easier to adapt approaches that have already demonstrated their effectiveness than to start from scratch. In addition, when a new innovative programme is planned, links with similar innovations elsewhere offer external validity and political reassurance for changes that may at first seem very risky.

Encourage participation through financial and other rewards

In a setting with scarce resources for rewarding innovative activities in health professional education, especially regarding teaching in the community, creative approaches must be developed. For example, community health workers who volunteer to teach or supervise student health professionals might receive public acknowledgement, and teachers with low salaries might be accorded university-teacher status, subsidized housing, additional training and other rewards.

Teachers in medical subjects at the University of Dar es Salaam, United Republic of Tanzania, who also teach at community sites receive a small but welcome salary supplement in the form of a per diem allowance. In turn, the community benefits from additional human resources for health.

5. Organizational and practical issues

The success of innovations depends on the degree to which a broad base of support can be generated within each of the three linked constituencies: the educational institution, the health service sector and the community.

5.1 Getting started

Many factors motivate teachers, health workers and communities to participate in an innovation. An effective strategy for recruiting teachers is through their personal experience with students engaged in the innovation. Cogent arguments and even research results supporting the validity of an innovation are surprisingly ineffective motivators of change for the majority of teachers, perhaps because many teachers see health professional education as a "chore" and as an "art" without its own scientific basis.

Most institutions value the contribution of staff members to research and clinical work far more than their teaching or their work in the community. In such an environment, the commitment of teachers to an educational endeavour may be guided more by departmental politics and resource considerations than by scientific evidence about optimal teaching approaches. It is essential for institutional leadership to be committed to re-evaluating and strengthening rewards and incentives for educational efforts and community health work.

The health service sector should be more active in identifying human resources and research needs to improve health care, and continuing education needs for practitioners. This implies, however, that educational institutions must also accept new responsibilities in those areas.

Community participation can be initiated in a variety of ways. In some cases, community leaders can be invited to become partners with the education and health service sectors. Alternatively, community leaders can sometimes mobilize needed resources through their political representatives.

5.2 Resource needs for curricular development

In the current state of the global economy, especially in developing countries, the cost of educational innovation is often seen as a barrier to needed change. While some educational institutions obtained financial support in the 1970s to implement innovative programmes, the vast majority of educational innovations in the 1990s will have to occur within existing or even shrinking budgets.

Most of the world's educational institutions use traditional teaching methods. Important changes can occur within single departments or individual courses, and, if successful, can diffuse through the institution. Many important innovations require little additional funding. Changing the manner in which staff work with students to promote more student-centred learning, or expanding the definition of "teacher" to include professionals in other health-related fields (training for multidisciplinary practice) may require only a reallocation of existing resources. Small amounts of initial seed money can be used to create a climate for change that can be sustained and expanded by appealing to a broad constituency. In addition, change can be incremental. However, education and research activities carried out in the community may require new budget lines, for example for transport of students, supervisors and researchers to their workplaces. Plans for a series of small changes are often more successful than plans for grander change, because they are less threatening and can be tested and given time to win converts without causing a major upheaval.

For institutions contemplating extensive innovations, such as the introduction of problem-based learning and community-oriented learning, resource needs may be greater. For example, there should be adequate small-group learning space at the institution and adequate access to an appropriate array of learning resources for students to use in solving problems raised at the institution and for students and health providers to use at health care sites.

It has been the experience of teaching staff from virtually all schools undergoing major curriculum reform that too much staff time is devoted to curriculum materials development and too little to staff development. Since it is far easier and more economical to modify existing curriculum materials than to produce new ones, a review of existing materials can be an important time-saver.

5.3 Community sites

Community site selection should be a shared decision between the community, the health service and the educational institution. This joint planning should ensure that the community's explicit health care needs are addressed, as well as the education or research needs of the institution. The three partners should devote time and resources to ensuring adequate transport, student living space and room for students' clinical work and the availability – and, where necessary, training – of community teachers as role models.

Many educational institutions strongly believe that the value of a community experience is proportional to the degree of student participation and the amount of needed service students feel they are providing to that community. For this reason, many schools provide students with early and sustained clinical skills training (e.g. interviewing,

history-taking, physical examination, simple laboratory skills and community assessment skills). Students thus gain the satisfaction of providing a useful, if rudimentary, clinical service, and the community health care team tends to welcome them more as junior partners than as superfluous "passengers". Even without extensive preparation, students are able to provide comfort and care and to act as channels for health information and services.

To equip students with more effective skills for working in the health care system and with communities, different types of community-oriented learning should be included throughout the curriculum (e.g. lectures, small-group discussions, tutorial case problems, ward rounds, self-study). Variety of learning methods should be emphasized, since students differ in their preferred learning styles and capacities.

5.4 Creating favourable administrative structures

It is important to devote resources to creating an organizational and administrative structure that favours the linkage and interdependency of different departments and health fields within the health educational institution and between the institution and the health service sector. Traditional administrative structures within educational institutions may separate teaching staff into different specialties, a separation that serves as a major barrier to the integration of subjects and the formation of partnerships between institution and community that are essential for meaningful school-wide change.

To reduce departmental control over the curriculum while enhancing the effectiveness of an integrated curriculum, schools have set up matrix forms of educational administration, in which a teacher from one department joins teaching staff from other departments in a cross-departmental administrative unit. Such units could focus on commonly occurring community health problems. For example, in a unit concerning prevention and treatment of heart disease, a physiologist, a nutritionist, an anatomist, a registered nurse, a psychologist, an epidemiologist and a primary health care physician could design a curriculum, all the way from case-material development to student surveys of community risk factors for cardiovascular disease. Such collaborations can facilitate partnerships between educational institutions and the community and foster intersectoral education efforts for community health (see box for examples from the Islamic Republic of Iran and Zambia).

The Government of the Islamic Republic of Iran decided that health care delivery and medical education should be put under one authority. Health sciences universities were established in all provinces that did not have medical schools, and the dean of the health sciences university became the director of health services in that province. In this way, the health sciences universities were made responsible for providing comprehensive health care to the community. Students now come into contact with the community throughout their education. All their training in hospitals and clinics revolves around identifying and solving the priority health problems of the community they serve.

The School of Medicine at the University of Zambia, in collaboration with the Ministry of Health, has launched a four-year postgraduate training programme in general practice for physicians. The postgraduate students spend the first year upgrading their knowledge of basic sciences at the teaching hospital in Lusaka. They spend the remaining three years working at a Ministry of Health district hospital under the close supervision of specialist district medical officers. During this period they are expected to learn, in an integrated manner, the skills of specialties such as surgery, medicine, paediatrics, community health, management, and obstetrics and gynaecology. They are periodically visited by the specialists based at the teaching hospital.

The intention is that the students will acquire problem-solving skills in an integrated way and at the same time be exposed to the real-life situations in which they will later be expected to work. The students also provide valuable services at the district level — a level very poorly staffed at present. The specialist district medical officers who act as supervisors are considered full members of the academic staff of the medical school, with a monthly teaching allowance and eligibility for promotion.

6. Conclusions

The search for relevance in the education of health professionals has mobilized the energies of educators, primarily in adapting curricula to meet health needs in society and in introducing more attractive and efficient learning processes. The impact of educational programmes on the behaviour of health professionals in practice has still to be established.

Innovations in the education of health professionals must go hand in hand with innovations in health service delivery. Educational institutions must develop new alliances with health care institutions, professional associations and the community at large to help improve health services delivery and to produce graduates who fit better into the health system.

7. Recommendations

7.1 Recommendations to educational institutions

The Study Group recommends that educational institutions for health professionals should:

1. Review their *mission statements or institutional goals* to ensure that they include recognition of the accountability of the institution for the quality of its graduates and their effective contribution to solving priority health problems in the community.
2. Establish *enduring partnerships* in the community to make educational programmes more responsive to the existing and future health needs of the community and develop internal and external administrative structures supporting such partnerships. In some situations this may require the establishment of a special mechanism or the appointment of a person to initiate the process.
3. Conduct *action research* to assess and guide the educational institution's move towards greater accountability for the improvement of health care in the community and for the impact of its graduates in responding to society's health needs and expectations.
4. Shift existing resources to *health systems research* activities that will be of use to health authorities and health care institutions for policy formulation and health management.
5. Ensure the *relevance of educational programmes* and of health problems selected to serve as a basis for learning, by taking into account the expectations of health care consumers, health professionals and health authorities.
6. Evaluate educational programmes in terms of their *impact on the practice of health professionals* and ultimately on the health of the community.
7. Ensure that the use of *problem-based learning* at all levels – basic, post-basic and continuing education – will help to address community health needs better.
8. Support *long-term evaluation* efforts to keep track of graduates, documenting their career choices and their contribution to solving priority health problems, with a view to reorienting basic and post-basic educational programmes as necessary and delivering appropriate continuing education.

7.2 Recommendations to Member States

The Study Group recommends that Member States should:

1. *Provide incentives and remove unnecessary barriers* to facilitate collaboration between educational institutions, health services and

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communities to improve the impact of the education of health professionals on health care.

2. *Use the potential of educational institutions* to help the health sector in formulating policy and in planning, implementing and evaluating health care delivery and management through multisectoral and multidisciplinary approaches. This can be achieved by provision of contracts and grants in areas such as organization of health care, fairer distribution of health professionals, cost-effectiveness analysis of disease control programmes, quality assurance and technology assessment.

3. *Provide financial and administrative support* for action research by educational institutions to assess the impact of educational programmes on health in the community and of community partnerships on the institutions themselves.

4. *Ensure that research findings are used* for guiding policy development and directing educational institutions in implementing their new roles and responsibilities, and allocate additional resources to support institutions in these activities.

7.3 Recommendations to WHO

The Study Group recommends that WHO should:

1. *Encourage the development of guidelines and models* that will support action research by educational institutions to determine to what extent their participation in health care delivery and management meets society's health needs and expectations, and whether community-oriented programmes strengthen graduates' ability to meet those needs.

2. *Collaborate with educational institutions* worldwide that are interested in conducting pilot projects to test models of interaction with the health care system, and facilitate the exchange of information and staff among them.

3. *Encourage the monitoring, documentation and publicizing* of research conducted in educational institutions that have built up partnerships with the health care sector and taken on new responsibilities in health care delivery and management.

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